IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended). A material processing system comprising:

a process tool;

a plurality of sensors coupled to said process tool to measure tool data; ~~and~~

a controller coupled to said plurality of sensors and configured to receive said tool data, said controller configured to use a process performance prediction model to determine predicted process performance data from said tool data, to compare said predicted process performance data with target process performance data, and to use said comparison to detect a fault; and

a magnetic field system disposed around the process tool and configured to increase plasma density.

2. (Original). The material processing system as recited in claim 1, wherein said process performance data comprises at least one of mean etch depth and etch depth range.

3. (Original). The material processing system as recited in claim 1, wherein said tool data comprises at least one of a capacitor position, a forward radio frequency (RF) power, a reflected RF power, a voltage, a current, a phase, an impedance, a RF peak-to-peak voltage, a RF self-induced direct current bias, a chamber pressure, a gas flow rate, a temperature, a backside gas pressure, a backside gas flow rate, an electrostatic clamp voltage, an electrostatic clamp current, a focus ring thickness, RF hours, and focus ring RF hours.

4. (Original). The material processing system as recited in claim 1, wherein said process performance prediction model comprises an output from a partial least squares analysis.

5. (Original). The material processing system as recited in claim 1, wherein said fault occurs when a difference between said predicted process performance data and said target process performance data exceeds a threshold difference.

6. (Currently Amended). A process performance prediction system comprising:

a plurality of sensors capable of being coupled to a process tool to measure tool data; and

a controller coupled to said plurality of sensors configured to receive tool data, said controller configured to use a process performance prediction model to predict process performance data from said tool data, to compare said process performance data with target process performance data, and to use said comparison to detect a fault; and

a magnetic field system disposed around the process tool and configured to increase plasma density.

7. (Original). The process performance prediction system as recited in claim 6, wherein said process performance data comprises at least one of mean etch depth and etch depth range.

8. (Original). The process performance prediction system as recited in claim 6, wherein said plurality of sensors are capable of measuring said tool data that comprises at least one of a capacitor position, a forward radio frequency (RF) power, a reflected RF

power, a voltage, a current, a phase, an impedance, a RF peak-to-peak voltage, a RF self-induced direct current bias, a chamber pressure, a gas flow rate, a temperature, a backside gas pressure, a backside gas flow rate, an electrostatic clamp voltage, an electrostatic clamp current, a focus ring thickness, RF hours, and focus ring RF hours.

9. (Original). The process performance prediction system as recited in claim 6, wherein said process performance prediction model comprises an output from a partial least squares analysis.

10. (Original). The process performance prediction system as recited in claim 6, wherein said fault occurs when a difference between said predicted process performance data and said target process performance data exceeds a threshold difference.

11. (Currently Amended). A process performance prediction system comprising:

a plurality of sensors capable of being coupled to a process tool to measure tool data;

means for predicting process performance data from said tool data; ~~and~~

means for detecting a fault by comparing said process performance data with target process performance data; and

a magnetic field system disposed around the process tool and configured to increase plasma density.

12-36 (Canceled).

37 (New). The material processing system of claim 1, wherein the controller is coupled to the magnetic field system and is configured regulate magnetic field strength.

38 (New). The material processing system of claim 1, wherein the controller is coupled to the magnetic field system and is configured regulate speed of rotation of a rotating DC magnetic field disposed within the magnetic field system.

39 (New). A material processing system comprising:

a process tool;

a plurality of sensors coupled to said process tool to measure tool data;

a controller coupled to said plurality of sensors and configured to receive said tool data, said controller configured to use a process performance prediction model to determine predicted process performance data from said tool data, to compare said predicted process performance data with target process performance data, and to use said comparison to detect a fault; and

an inductive coil disposed around the process tool and configured to increase plasma density.

40 (New). A material processing system comprising:

a process tool;

a plurality of sensors coupled to said process tool to measure tool data;

a controller coupled to said plurality of sensors and configured to receive said tool data, said controller configured to use a process performance prediction model to determine predicted process performance data from said tool data, to compare said predicted process performance data with target process performance data, and to use said comparison to detect a fault;

a first electrode disposed within the process tool;

a second electrode opposing the first electrode;

a first RF generator coupled to the first electrode and configured to couple power at a first RF frequency; and

a second RF generator coupled to the second electrode and configured to couple power at a second RF frequency,

wherein the second RF frequency is different than the first RF frequency.